



DEPARTMENT OF THE AIR FORCE  
59TH MEDICAL WING (AETC)  
JOINT BASE SAN ANTONIO - LACKLAND TEXAS

18 MAY 2016

MEMORANDUM FOR ST

ATTN: DEBRA M NIEMEYER

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Air Force Personalized Medicine Program Panel: Representative Research at the 59<sup>th</sup> Medical Wing San Antonio Military Medical Center** presented at/published to **SAMHS & Universities Research Forum (SURF), UTSA, San Antonio, TX 20 May 2016** with MDWI 41-108, and has been assigned local file #**16202**.
2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.
3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are 59 MDW staff member, we can forward your request for funds to the designated wing POC.
4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC  
Director, Clinical Investigations & Research Support

## PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

### INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

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**San Antonio Military Health System**



**Joint Base San Antonio, Texas**

## **Air Force Personalized Medicine Program Panel:**

## **Representative Research at the 59th Medical Wing San Antonio Military Medical Center**

**Dr. Deb Niemeyer, PhD, DAF  
Chief Scientist**

**Dr. Vic Sylvia, PhD, CTR  
Senior Scientist**

**59<sup>th</sup> Medical Wing  
Wilford Hall, JBSA, TX**

**20 May 2016**

## Disclaimer:

The opinions expressed in this presentation are solely those of the author(s) and do not represent an endorsement by or the views of the United States Air Force, the Department of Defense, or the United States Government.

# Introduction

The Uniformed Services University of the Health Sciences and USAF Force Personalized Medicine and Advanced Diagnostics Program partnership seeks evidence to enhance support for the utilization of genetics, genomics, pharmacogenomics, proteomics, and bioinformatics tools to optimize prevention, diagnosis, early intervention and treatment strategies at the San Antonio Military Health System.

Panel members will describe studies in Disease Management providing evidence for the integration of personalized data into clinical decision-making, especially during the prevention and treatment of common yet complex disorders, to improve healthcare outcomes. Facility capabilities in support of military personalized medicine research will also be presented.





# Panel Members



- Dr. Victor Sylvia (Moderator)
- Dr. Clifton Dalgard
- Maj Thomas Beachkofsky
- Dr. Thomas Gibbons
- LTC Lawrence Petz
- Dr Lisa Lott





# Overview

- Strategic Alignment
- Strategic Priority and Objectives
- Program Portfolio and Implementation
- Panel Member Presentations



## Obama pushes 'Precision Medicine Initiative'

David Jackson, USA TODAY 1:12 p.m. EST January 30, 2015



President Obama asked Congress on Friday to approve \$215 million for a 'Precision Medicine Initiative' designed to help doctors tailor treatments to the individual characteristics of their patients. VPC  
<http://www.usatoday.com/story/news/nation/2015/01/30/obama-precision-medicine-initiative-white-house/22547019/>

*Precision medicine is so important that it's on President Obama's mind every morning. Why? Because the technology to manage data at scale can change health care for the better. In her first diginomica piece, SAP's Enakshi Singh explains the potential.*

[http://diginomica.com/2015/07/15/precision-medicine-can-change-health-care-silo-thinking/#.VaQjEhEw\\_gM](http://diginomica.com/2015/07/15/precision-medicine-can-change-health-care-silo-thinking/#.VaQjEhEw_gM)



## White House Releases Proposed Precision Medicine Initiative Privacy Framework

7/17/2015 by Debra McCurdy | Reed Smith

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Earlier this year, President Obama launched a high-profile "Precision Medicine Initiative" (PMI) to develop treatments, diagnostics and prevention strategies tailored to the individual genetic characteristics of each patient. On July 8, 2015 the White House released for public comment a draft document entitled "Precision Medicine Initiative Proposed Privacy and Trust Principles," which provides broad guidance concerning: governance; transparency; reciprocity; respect for participant preferences; data sharing, access and use; data quality and integrity; and security within the context of the PMI. The principles include "strategies for engendering public trust and maximizing the possible benefits of a large national research cohort, while minimizing the risks inherent in large-scale data collection, analysis, and sharing." The White House is accepting public comments on the proposed principles through August 7, 2015.

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<http://www.jdsupra.com/legalnews/white-house-releases-proposed-precision-56178/>



# A Service Strategic Priority

AFMS Vision—Trusted Care: “Our supported population is the healthiest and highest performing segment of the U.S. by 2025.”

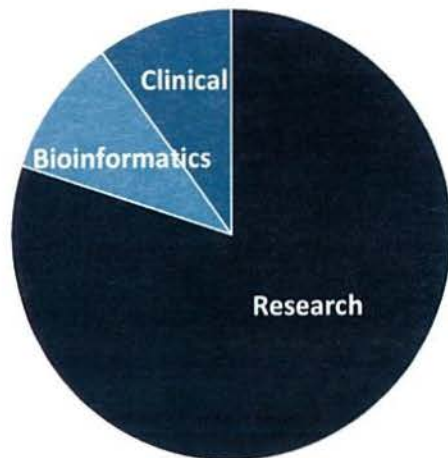
AF Global Horizons Final Report: “The game changer for the Air Force is personalized health and performance.”

59MDW Vision: Developing Warrior Medics Through Patient-Centered Care.

## Personalized Medicine Program Transition

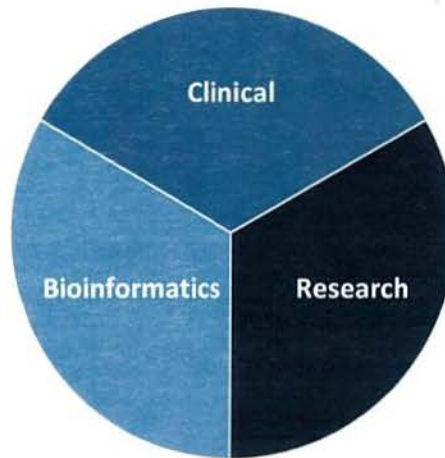
### Phase I (FY11-13):

Research to  
Demonstrate Clinical Utility



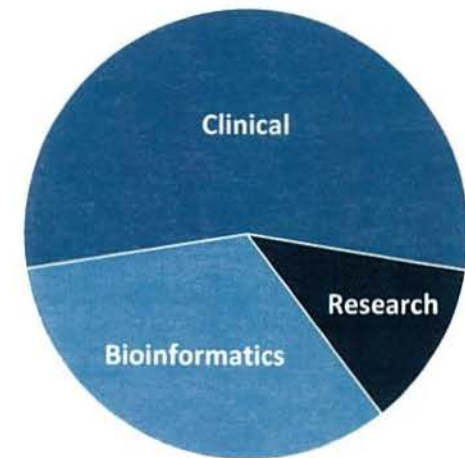
### Phase II (FY14-16):

Transition of Research, Policy,  
& Bioinformatics Program Elements



### Phase III (FY17+):

Clinical Policy  
& Bioinformatics Integration





# Advanced Diagnostics, Personalized Medicine and Big 'My' Data

## Near Term (2019)

- Enhance Genetic Marker Research Data, Tissue and Specimen repository
- Elucidate biomarkers of enhanced risk of future diabetes and prediction of future disease,
- Evaluate and validate advanced diagnostic technologies, including automated nucleic acid extraction for complex matrices, DNA next gen sequencing and Real-Time Polymerase Chain Reaction (PCR) technology for RNA and DNA pathogens of both viral and bacterial etiology
- Optimize molecular assays for PCR identification of MERS CoV, Coronavirus , pandemic Influenza AH7N9 and other emerging /re-emerging disease threats of military importance , and FDA approval for diagnostic use.

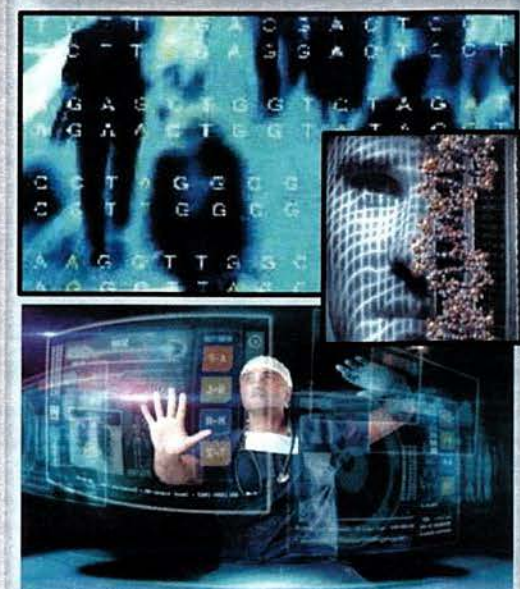
## Mid Term (2024)

- Demonstrate personalized treatment for diabetes, cardiovascular, pulmonary disease based on pharmacogenomic therapy
- Place into practice genetic markers for musculo-skeletal injuries and ailments to implement preventive measures in military field training sites.
- Rapidly characterize etiological pathogens of sepsis in support of same-day treatment-specific modalities.
- Leverage joint personalized medicine efforts to utilize biomarkers of physiological response to opioid use.
- Transition smartphone-based pathogen ID system to meet AF requirements for personalized medicine and infectious disease characterization.

## Far Term (2029)

- Produce a plug-and-play, closed system diagnostic array for emerging etiologic agent detection on ultra-small, rapid, ruggedized molecular detection platform.
- Assess autonomous field-forward micronucleic acid extraction/ sample processing methods.
- Miniaturized, wearable, multiplexed immunoassay nano-arrays for multiple panels, to include toxins, viruses, bacteria , host immune biomarkers on Personalized Bioinformatics.
- Expand use of non-nucleic acid technologies to decrease diagnostic time to ID disease and disease susceptibility.
- Realize Big 'My' Data use for seamless individual health assessment & care

## Personalized Medicine



## Trusted Care





# Personalized Medicine Roadmap

Methods/tools (CPGs)  
for diagnosis,  
treatment and  
interventions using  
'Omics

FY13

FY14

FY15

FY16

FY17

FY18

FY19

Pharmacogenomic Risk Profile Application in a Clinical Setting

0 4

1

2

1 5

Optimization of Pharmacologic Cardiovascular Personalized Care Using Genomics-Based Risk Characterization

0 4

1

2 5

Reduce Time to Detection of Human Sepsis

0 4

1 5

3 6

Biomarkers to Predict Clinical Course

0 4

1 5

2 6

O&M

RDT&E

JPC

SBIR

Other

Decision Point

Milestone

Translational Event

TRL

CBA:

AFMS and  
MAJCOM Needs  
(Research  
Knowledge)

1

Develop & Revise Clinical Practice Guidelines (CPGs): Personalized treatment for T2DM

individual's response to cardiac therapeutics

3

Provide universal standard sample and amplicon preparation protocol; point of care Sepsis

testing tool

4

Develop algorithm based on biomarkers to predict therapeutic clinical response

2

CPGs: Variations in a patient's DNA used to predict



# Personalized Medicine Program Portfolio

Representative Extramural Projects	Representative Intramural Projects
Coriell Institute: Clinical Utility Study (CUS)	Epigenetic Biomarkers of Stress at High Altitude Conditions
Johns Hopkins Applied Physics Laboratory (JHU-APL): PC2 Program	711HPW Advanced Genomics and Technology Center Sequencing Validation
Duke University: Genetic Risk Testing & Health Coaching for T2D and CHD	Tele-genetics, Project ECHO within the AFMS
Duke University: Genetically Guided Statin Therapy	Regenerative/Restorative Medicine Research Program
Duke University: Implementation, Adoption, and Utility of Family History in Diverse Care Settings	Development of Human Mesenchymal Stem Cells for Treatment of Immune System Dysregulation in Neurological & other Diseases
Yale University: Identification of Associations between Genetic Factors and Asthma that are Modified by Obesity	Immune Modulation of PolyTrauma
Nationwide Children's Hospital: A Collaborative Translational Autism Research Program for the Military	Characterization of High Mobility Group Box Protein 1 (HMGB1) as a novel early biomarker for injury severity and the coordination of patient evacuation
	Adverse Childhood Experience Serotonin Transporters and Telomeres: A Gene Environmental Interaction Study of the Risk of PTSD in Soldiers
<b>PANEL PRESENTATIONS</b> (update order as needed)	Biomarkers for Mental Illness and Recovery using Sleep as a Mediator: A Randomized Controlled Trial
Population Genomics Innovation for Personalized Medicine in the Military	Characterization of the Proteomic Response to Hydrocodone: Plasma and Urine
Genetic & Epigenetic Biomarkers of Cutaneous Adverse Drug Reactions	Genetic Epidemiology of Risk-Associated Single Nucleotide Polymorphisms (SNPs) of Type 2 Diabetes (T2D) Mellitus
SAMHS / 59MDW Clinical Research Division Laboratory Capabilities and Supported Personalized Medicine Research	Pharmacogenomic Risk Profile Application for Clinical Setting
SAMHS / BAMC Department of Clinical Investigations Laboratory Capabilities and Supported Personalized Medicine Research	Optimization of Pharmacologic CV Personalized Care Using Genomic-Based Risk Characterization
59MDW Center for Molecular Detection and Personalized Medicine Research of Military Significance	Genetic Marker Repository
	Genetic & Epigenetic Biomarkers of Cutaneous Adverse Drug Reactions
	Predictors of Immune Status



# Program Implementation

- Translate results into *Best Practice* and *Policy*
- Improve education for and support to Providers and Patients to integrate 'Omics' into Healthcare
- Establish relevance to Operational community



# Success through Collaboration and Innovation...





# Panel Member Presentations



**“Prepare for the unknown by studying how others in the past have coped with the unforeseeable and the unpredictable”**  
-- George S. Patton



**“Victory smiles upon those who anticipate the changes in the character of war...not upon those who wait until after those changes have occurred.”**  
-- Giulio Douhet



**“The true sign of intelligence is not knowledge but imagination”**  
-- Albert Einstein

